

### **REMARKS**

Claims 32-62 are presently pending. Claims 41-48 and 58-62 have been allowed. Claim 37 has been indicated as allowable if rewritten in independent form. Claim 37 has been amended to be in independent form without adding or modifying any claim limitations. In view of the remarks that follow, reconsideration is respectfully requested of the remaining pending claims.

#### **Independent Claim 32**

Claim 32 was rejected under 35 U.S.C. § 103 as being obvious over Ding U.S. Patent No. 6,387,805 in view of Adams ("Titanium-nitride self encapsulation of Cu and Ag films on silicon oxide"). Applicant traverses this rejection on the grounds that the references are defective in establishing a *prima facie* case of obviousness with respect to Claim 32.

In the present application, Claim 32 includes a recitation of:

a fill layer comprised of Cu and Ti filling said opening in said  
insulating layer

The examiner asserts (page 2, line 14) that Ding teaches "a fill layer of Cu-Ti over the insulating layer". Although Ding describes a Cu alloy, the Cu alloy in Ding does not function as a fill layer. Instead, "[t]he copper alloy layer serves as a seed or wetting layer for subsequent filling of via holes and trenches with substantially pure copper." Abstract. Therefore, claim 32 is deemed to be allowable over the prior art.

Claim 32 was also rejected under 35 U.S.C. § 103 as being obvious over Jiang U.S. Patent No. 6,693,356 in view of Adams. For the same reason discussed above with respect to Ding and Adams, Applicant traverses this rejection on the grounds that the references are defective in establishing a *prima facie* case of obviousness with respect to Claim 32.

The examiner asserts (page 3, line 5) that Jiang teaches "a fill layer of Cu-Ti over the insulating layer". Jiang does not describe a Cu-Ti fill layer, but describes a pure Cu fill layer (just like Ding). Specifically, Jiang describes "[a] copper-doped transition layer is positioned over the barrier layer; the transition layer has a resistivity higher than pure copper and is operable to strongly bond to copper and to the barrier layer, whereby electromigration reliability is improved. The remainder of said hole is filled with copper. Col. 2, lns. 15-20.

Claims 33-36, 38-40, and 57 further limit claim 32 and are therefore also deemed to be in condition for allowance.

#### Independent Claim 49

The Office Action rejected independent Claim 49 under 35 USC §103 over Ding in view of Adams. Applicant traverses this rejection on the grounds that the references are defective in establishing a *prima facie* case of obviousness with respect to Claim 49.

In the present application, Claim 32 includes a recitation of:

a fill layer comprised of Cu and Ti filling said opening in said insulating layer wherein said Ti is essentially uniformly distributed through said fill layer

As discussed above with respect to claim 32, none of the cited references describe "a fill layer comprised of Cu and Ti." Claim 49 is thus believed to be allowable for the same basic reasons as Claim 32, and notice to that effect is respectfully requested.


Claims 50-56 further limit claim 49 and are therefore also deemed to be in condition for allowance.

#### Conclusion

Based on the foregoing, it is respectfully submitted that all of the pending claims are fully allowable, and favorable reconsideration of this application is therefore respectfully requested. If the Examiner believes that examination of the present application may be advanced in any way by a telephone conference, the Examiner is invited to telephone the undersigned attorney at 972-739-8635.

The Commissioner is hereby authorized to charge any additional fee required by this paper, or to credit any overpayment, to Deposit Account No. 08-1394 of Haynes and Boone LLP.

Respectfully submitted,



David M. O'Dell

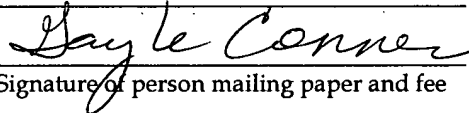
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Date: 7-12-05  
HAYNES AND BOONE, LLP  
901 Main Street, Suite 3100  
Dallas, Texas 75202 3789  
Telephone: 972.739.8635  
Facsimile: 214.200.0853  
File: 24061.587  
TSMC2000-0101C  
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